

What is claimed is:

1. A method of identifying a herbicidal compound, comprising:
  - a) combining a polypeptide comprising an amino acid sequence at least 90% identical to an amino acid sequence selected from the group consisting of the even numbered SEQ ID NOs:2-48 with a compound to be tested for the ability to bind to said polypeptide, under conditions conducive to binding;
  - b) selecting a compound identified in (a) that binds to said polypeptide;
  - c) applying a compound selected in (b) to a plant to test for herbicidal activity; and
  - d) selecting a compound identified in (c) that has herbicidal activity.
- 10 2. The method according to claim 1, wherein said polypeptide comprises an amino acid sequence at least 95% identical to an amino acid sequence selected from the group consisting of the even numbered SEQ ID NOs:2-48.
- 15 3. The method according to claim 2, wherein said polypeptide comprises an amino acid sequence at least 99% identical to an amino acid sequence selected from the group consisting of the even numbered SEQ ID NOs:2-48.
- 20 4. The method according to claim 3, wherein said polypeptide comprises an amino acid sequence selected from the group consisting of the even numbered SEQ ID NOs:2-48.
5. A method of identifying a herbicidal compound, comprising:
  - c) combining a polypeptide comprising an amino acid sequence at least 90% identical to an amino acid sequence selected from the group consisting of the even numbered SEQ ID NOs:2-48 with a compound to be tested for the ability to inhibit the activity of said polypeptide, under conditions conducive to inhibition;
  - d) selecting a compound identified in (a) that inhibits the activity of said polypeptide;
  - c) applying a compound selected in (b) to a plant to test for herbicidal activity; and
  - d) selecting a compound identified in (c) that has herbicidal activity.

6. The method according to claim 5, wherein said polypeptide comprises an amino acid sequence at least 95% identical to an amino acid sequence selected from the group consisting of the even numbered SEQ ID NOs:2-48.
- 5 7. The method according to claim 6, wherein said polypeptide comprises an amino acid sequence at least 99% identical to an amino acid sequence selected from the group consisting of the even numbered SEQ ID NOs:2-48.
- 10 8. The method according to claim 7, wherein said polypeptide comprises an amino acid sequence selected from the group consisting of the even numbered SEQ ID NOs:2-48.
9. A method for killing or inhibiting the growth or viability of a plant, comprising applying to the plant a herbicidal compound identified according to the method of claim 1.
- 15 10. A method for killing or inhibiting the growth or viability of a plant, comprising applying to the plant a herbicidal compound identified according to the method of claim 5.